Distribution of Small Emergent Wetlands and the Dynamics of a Black Rail Metapopulation in the Sierra Nevada Foothills

#0057

Technical Panel Review

Proposal Name: Distribution of Small Emergent Wetlands and the Dynamics of a Black Rail Metapopulation in the Sierra Nevada Foothills

Applicant Organization: University of California at Berkeley

Principal Lead Investigator(s):
Beissinger, Steven

Amount Requested: $538,775

TSP Panel Summary of Findings:

This proposal demonstrates both strengths and weaknesses. The panel commented that this was one of the best written proposals that was submitted. Qualifications of the project team are first-rate, including those of the PI. The project team has been working on this topic for some time and has done an admirable job of presenting data and analyses available to date. The proposed work is feasible and likely to be successful in producing quality results. The proposed project, if funded, will make contributions to our scientific understanding of metapopulations as well as increase knowledge regarding the small foothill wetlands that the proposal focuses on. In addition, the project will likely increase our ability to interpret remote-sensed data and develop layers relevant to managers and scientists.

However, the panel identified numerous weaknesses, including: 1) Its focus on a single species, in just one part of its range, in a region (foothills) that is not a high priority for the Science Program and this PSP. 2) Ecological factors, such as those limiting black rail populations, are not adequately addressed. Are these factors reflecting prey limitation, predator limitation, or direct abiotic influences? An ecologically-oriented conceptual model is not presented. The proposal provides results of preliminary analysis indicating that extinction of black rail subpopulations was best explained by either perimeter or area of the site, but the proposal does not explicate the mechanisms or give an

indication that ecological mechanisms influencing subpopulation extinction will even be addressed. 3) Insufficient attention is paid to hydrology, which would be an important factor dictating the creation and extinction of suitable habitat. There is reference to irrigation water, but what about more natural hydrological regimes, including runoff? 4) The proposal states that the project will address the topic of climate change, but the only aspect that will be addressed is rainfall. Rainfall is but one component of climate change. Furthermore, will differences in rainfall be examined on a spatial scale? What about the timing of rainfall? If only annual differences in rainfall will be examined, then inferences will be limited, at this stage of the project. 5) The use of CRAM to characterize these wetlands could fall short of providing information suitable for modeling or for supporting management. 6) Is the mapping component duplicative of the current state–wide effort to produce new NWI maps? If the answer is yes, Task 1 may not be necessary.

The population ecology of foothills black rails and how they interact with their environment will not be comprehensively studied, though some demographic processes will be illuminated, and informative modeling is likely to be a product of this project. Feasibility is high.

Although the panel agreed that it is scientifically wise to study a topic outside of the Delta if it is of some benefit to the Delta itself, such as population exchange and linkage to environmental water, ultimately the panel determined that this is a narrowly focused proposal, to be conducted in a habitat that is not a CALFED priority.

The panel has the following recommendations: 1) Include hydrological considerations (make a link between foothill tributaries and the Delta habitat); 2) Include a conceptual model that considers ecological drivers; 3) Determine how central this project is to CALFED goals 4) Ensure that the GIS component does not duplicate other statewide mapping efforts currently underway 5) Include a sentinal species perspective 6) Develop tools that could be used more broadly for other

wetland-dependent species including black rails and other birds and wildlife.

Relevance to PSP Topic Areas:

Low

TSP Technical Rating:
Superior

TSP Funding Recommendation:
Do Not Fund

TSP Amount Recommended: $**0**

Conditions:

External Technical Review #1

Proposal Title: Distribution of Small Emergent Wetlands and the Dynamics of a Black Rail Metapopulation in the Sierra Nevada Foothills

Proposal Number: 0057

Proposal Applicant: University of California at Berkeley

Purpose

Comments	**The proposed research involves two distinct but related projects. I found the goals, objectives and hypotheses to be quite clear, although one or two of the working hypotheses will undeniably be true; thus, I hope reporting focuses on magnitude and direction (i.e., effect size) of these relationships. I believe the ideas are well developed, very timely, and important. Having recently used NWI data in analyses I believe that NWI was relevant in it's time, but is largely outdated and too course scale to be used for small-scale research. Thus, the wetland mapping component is timely and useful and results should transcend the region. It is clear to me the study is justifiable given a sever lack of knowledge regarding the subtopics. I believe the authors have clearly demonstrated that results will be relevant at local, regional, and perhaps national scales. The proposed research should lead to advances in remote wetland delineation and mapping, broaden theory of metapopulation dynamics, and will include a variety of methodologies that may progress because of this project (e.g., telemetry of secretive rallids).**
Rating	**Superior**

Background

Comments	**The conceptual model is indeed clearly stated and explains the underlying basis for the work. I have no criticism regarding the "Background and Conceptual**

	Model" section and believe it clearly demonstrated the author's expertise in the topics. I believe there was more than adequate information to understand the basis for the work and documentation was superior given the constraints on length. If I had one suggestion, it would be the authors investigate modeling wetland use by black rails with respect to individual wetland characteristics. I imagine this will be part of the research, even if not proposed directly in this proposal (and perhaps I simply missed this).
Rating	**Superior**

Approach

Comments	**The approach is well thought out and I believe it project objectives will be easily met. I believe delegation of tasks and administration is clear given the proposed nature of the research, and resources are accounted for to complete these tasks. The plan to disseminate information is well thought−out and specific to each sub−project, including a timeline. The researchers propose to present and publish data in fashions (e.g., large symposia, project websites)that will allow this research to contribute to the scientific community at large.**
Rating	**Above Average**

Feasibility

Comments	**The project is, in my opinion, fully documented and feasible. Given the constraints on length, I wonder about specifics involving the sampling strategy (i.e., how will they stratify?) and the use of automated or remote telemetry, but these are minor details at best. I have no doubt the project will succeed in meeting objectives. The scale of the project matches the objectives and is clearly within the grasp of the authors. To reiterate, I believe the authors have demonstrated this project is**

	entirely feasible.
Rating	Superior

Budget

Comments	The budget is clear and well detailed. I've proposed projects in wetland mapping (albeit different) and radio-telemetry and believe the budget is by no means excessive and likely very realistic to conduct the proposed work with little waste.
Rating	Superior

Relevance To CALFED

Comments	This project appears to me to be entirely relevant to CALFED. It does not specifically address research need regarding fish species listed in the PSP, but information for this project will likely provide information relevant to those organisms as well. The project addresses 2 Priority Research Topics (at least) from my understanding, and involves nearly all the priorities listed in the PSP. The information will be useful to CALFED resource managers and policy makers directly. I believe this research project has great potential to produce results relevant to applied and basic ecology, which I appreciate.
Rating	Superior

Qualifications

Comments	The project team is extremely well qualified and represent, what I believe to be, an excellent mix of highly established researchers and proven research scientists.
Rating	Superior

Overall Evaluation Summary Rating

Comments	**I commend the authors on constructing a proposal that was a pleasure to read, flowed well, was well justified and relevant in many aspects to the funding agency. I rate this proposal "Superior" for its overall quality, attention to detail, and clearly stated approach to addressing multiple topics in a scientifically robust manner.**
Rating	**Superior**

External Technical Review #2

Proposal Title: Distribution of Small Emergent Wetlands and the Dynamics of a Black Rail Metapopulation in the Sierra Nevada Foothills

Proposal Number: 0057

Proposal Applicant: University of California at Berkeley

Purpose

Comments	**Goals and objectives are well stated and developed into a coherent program of study. Examination of small, discrete wetlands in the context of habitat for rare or endangered species is timely and important for conservation efforts. The integration of modern remote sensing, metapopulation theory, and field studies will generate a new and useful data set and a basis for improved protection of black rail.**
Rating	**Above Average**

Background

Comments	**Beissinger and his team are leaders in the proposed research and have a clear and well articulated research plan.**
Rating	**Above Average**

Approach

Comments	**Project management and functions of personnel are clear. In general, the approaches will meet the objectives. A few technical question arise with regard to the proposed remote sensing analyses: How much experience does the team have with object-based classification? NDVI seems a rather crude way to characterize black rail habitat. How will georectification of the historical images be done? Further concerns (some minor) include: What rainfall**

	stations are in the study area? The CRAM approach to characterize grazing regime, hydrology and vegetation seems overly simplistic for a study that is, in general, sophisticated. The considerable effort and cost of the mark–recapture and telemetry work does not seem essential. The proposed simulation modeling seems rather tentative.
Rating	Above Average

Feasibility

Comments	Each task is feasible but not all need to done to meet useful objectives. The experience of the team lends considerable credibility to the likelihood of success.
Rating	Above Average

Budget

Comments	Tasks 1 and 2 seem reasonable, but task 3 seems expensive and not central to CALFED's needs. Task 4 is inexpensive and potentially useful to managers.
Rating	Sufficient

Relevance To CALFED

Comments	While a case is made for relevance to CALFED, it does not seem central to the mission. A descoped project that mapped wetlands and the presence of black rails, and was supplemented by an NSF funded project that dealt with modeling seems more reasonable. While it is correctly stated that there is little information on inland wetlands within the catchment of the Bay–Delta system, it seems unlikely that isolated, foothill wetlands about 0.5 ha in area will have significant direct impacts downstream.

Rating	**Sufficient**

Qualifications

Comments	**Beissinger, PhD student Richmond and research assistant Tecklin represent a superb team. The unnamed postdoc cannot be judged, but one can assume that Beissinger would attract and hire a qualified individual. Past performance, qualifications and infrastructure are fine.**
Rating	**Superior**

Overall Evaluation Summary Rating

Comments	**While a well presented and plannned proposal by an excellent team lead by a renouned professor, the cost relative to the priorities of CALFED seem too high and the project seems of secondary relevance to the primary CALFED objectives**
Rating	**Sufficient**

External Technical Review #3

Proposal Title: Distribution of Small Emergent Wetlands and the Dynamics of a Black Rail Metapopulation in the Sierra Nevada Foothills

Proposal Number: 0057

Proposal Applicant: University of California at Berkeley

Purpose

Comments	**The goals of the proposed work on clearly stated and provide a consistent framework for the proposal activities. The focus on small inland wetlands is timely because the number and distribution of these key habitats has changed and will continue to change in the near future. The focus on small wetlands is significant because these habitats have received little previous attention despite their potential importance and thus provide an important opportunity to add to our existing knowledge base. The research proposed will integrate a series of measurements and models towards a series of related goals and will generate new and novel methods and unique information.**
Rating	**Superior**

Background

Comments	**The proposal is extremely clear in its explanation of the underlying conceptual model and the measn by which the various goals are integrated into a single research plan. The proposal is exceptional in this regard. The proposal presents all of the information needed to understand the proposed work in an orderly and informative manner.**
Rating	**Superior**

Approach

Comments	The experience of the investigators with the study system has enabled them to construct a very robust study design that combines a number of interrelated elements. Management of the project is clearly explained and adequately funded. The potential for significant products is very high. Dissemination of project information will be through publications and a web page. I would have liked to see a more detailed plan for disemination to resource managers.
Rating	Superior

Feasibility

Comments	The study plan is presented in clear and compelling detail. Previous investigations by project personnel have demonstrated the feasibility of the field methods. The development of wetland classification tools using remotely-sensed data is certainly feasible, although there is no certainty of success. However, the potential utility of these new tools more than justify the modest amount of risk involved. The overall likelihood of project success is very high. The authors are well suited to bring the project to a successful conclusion.
Rating	Superior

Budget

Comments	The budget is clearly presented by task and is adequate to carry out the proposed work. Beissinger has requested only one month of support annually, but this does not reflect his total commitment to this project. I would have felt comfortable had he requested twice as much support for himself.
Rating	Above Average

Relevance To CALFED

Comments	**The proposal squarely addresses topics 3 and 4 of the PSP as well as topics in the Priority Research Topic List. Moreover, there is a strong and varied modeling component to the proposal that is one of the other priorities of the PSP. In addition, the proposal integrates many differnt data streams, and capitalizes or a variety of existing data sources. The information generated will be very useful to CALFED managers.**
Rating	**Superior**

Qualifications

Comments	**Most of the project participants already have extensive experience in measuring the habitat characteristics and populations that form the basis of the proposal. They already have initial data and models and they have access to extensive infrastructure through UC-Berkeley and other institutions. The lead investigator, Beissinger, is extremely productive, and the team as a whole is well qualified.**
Rating	**Superior**

Overall Evaluation Summary Rating

Comments	**Ths is a very well presented proposal that lays out a well integrated mix of GIS/RS, population and simulation models driven by a very strong field program. The goals of the proposal fit well with CALFED objectives, and the proposed research will produce a wide variety of products that will be extremely useful to CALFED managers. The Rail work is particularly detailed and strong and will lead to a significant increase in our understanding of the species' biology. A very impressive proposal.**
Rating	**Superior**